CLAIMS

We claim:

1. A method for analyzing activation pathways controlled by neurotransmitters comprising,

(i) obtaining a nucleic acid from a biological sample;

(ii) contacting the nucleic acid with a micro-array comprising capture probes derived from the 5 major subfamilies of amine neurotransmitter receptors, under conditions allowing hybridization of complementary strands; and

(iii) analyzing a two dimensional pattern of data present as intensities of spots on the surface of a support of the micro-array, one spot being sufficient for obtaining the information on one neurotransmitter subtype.

2. The method according to claim 1, wherein the micro-array comprises capture probes specific for at least 2 subtypes of dopamine receptors, 2 subtypes of histamine receptors, 4 subtypes of serotonin receptors, 2 subtypes of adrenergic receptors and 4 subtypes of cholinergic receptors.

3. The method according to claim 1, wherein the micro-array comprises capture probes for at least 20 different subtypes or sub-subtypes among the 5 subtypes for dopamine, 4 subtypes for histamine, 14 subtypes for serotonin, 5 subtypes for adrenergic and 16 subtypes for cholinergic.

4. The method according to claim 3, wherein the micro-array further comprises capture probes for the detection of 1 subtype of octopamine and the 14 subtypes of trace amines.

5. The method according to claim 1, wherein the capture probes are derived from the list in table 1.

6. The method according to claim 1, wherein the capture probes are derived from the sense or from the antisense strand of the gene encoding the receptor.

7. The method according to claim 1, wherein the target nucleic acid derived from a biological sample is RNA or cDNA.

8. The method according to claim 1, wherein the nucleic acid is labeled during synthesis of cDNA.

9. The method according to claim 8, wherein the label comprises fluorescent dyes, radiolabels, enzymes or colorimetric labels.

10. A method for evaluating the activity of a chemical compound on brain tissue comprising,

(i) contacting brain tissue or a cell culture derived therefrom with a chemical compound;

(ii) isolating nucleic acid from cells of the brain tissue or culture;

(iii) optionally amplifying the nucleic acid obtained;

(iv) contacting the nucleic acid with a micro-array comprising capture probes derived from the 5 major subfamilies of amine neurotransmitter receptors, under conditions allowing hybridization of complementary strands; and

(v) analyzing the two dimensional pattern of data present as intensities of spots on the surface of a support of the micro-array, and comparing the data obtained with data obtained with a tissue or cells that had not been in contact with the chemical compound; and

(vi) comparing the data obtained from the different samples.

11. The method according to claim 10, wherein the micro-array comprises capture probes specific for at least 2 subtypes of dopamine receptors, 2 subtypes of histamine receptors, 4 subtypes of serotonin receptors, 2 subtypes of adrenergic receptors and 4 subtypes of cholinergic receptors.

12. The method according to claim 10, wherein the micro-array comprises capture probes for at least 20 different subtypes or sub-subtypes among the 5 subtypes for dopamine, 4 subtypes for histamine, 14 subtypes for serotonin, 5

subtypes for adrenergic and 16 subtypes.

13. The method according to claim 12, wherein the micro-array includes capture probes for the detection of 1 subtype of octopamine and the 14 subtypes of trace amines.

14. The method according to claim 10, wherein the capture probes are derived from the list given in table 1.

15. The method according to claim 10, wherein the capture probes are derived from the sense or from the antisense strand of the gene encoding the receptor.

16. The method according to claim 10, wherein the target nucleic acid derived from a biological sample is selected from RNA or cDNA.

17. The method according to claim 10, wherein the nucleic acid is labeled during synthesis of cDNA.

18. The method according to claim 17, wherein the label comprises fluorescent dyes, radiolabels, enzymes or colorimetric labels.

19. The method according to claim 10, wherein the tissue to be investigated is the cortex, striatum, hippocampus, cerebellum, olfactory bulb, limbic regions, hypothalamus, thalamus, nucleus accumbens, amygdaloid nuclei, substantia nigra or an extract obtained from any of these.

20. A method for identifying a compound useful for treating a neurological disorder, comprising,

(i) contacting brain tissue or a cell culture derived therefrom with a chemical compound;

(ii) isolating nucleic acid from cells of the brain tissue or culture;

(iii) optionally amplifying the nucleic acid obtained;

(iv) contacting the nucleic acid with a micro-array comprising capture probes derived from the 5 major subfamilies of amine neurotransmitter receptors, under conditions allowing hybridization of complementary strands;

and

(v) analyzing the two dimensional pattern of data present as intensities of spots on the surface of a support of the micro-array, and comparing the data obtained with data obtained with a tissue or cells that had not been in contact with the chemical compound; and

(vi) comparing the data obtained from the different samples.

21. The method according to claim 20, wherein the compound is capable of modulating the onset or progression of a disease associated with neuronal performance, such as Parkinson, epilepsy, Alzheimer, depression, anxiety or aging.

22. The method according to claim 21, wherein the compound is capable of modulating the expression level of at least one gene associated with each of at least 4 of the 5 neuronal receptor subtypes.

23. A micro-array for analyzing activation pathways controlled by neurotransmitters, comprising capture probes derived from the 5 major subfamilies of amine neurotransmitter receptors.

24. The micro-array according to claim 23, further comprising capture probes specific for at least 2 subtypes of dopamine receptors, 2 subtypes of histamine receptors, 4 subtypes of serotonin receptors, 2 subtypes of adrenergic receptors and 4 subtypes of cholinergic receptors.

25. The micro-array according to claim 23, further comprising capture probes for at least 20 different subtypes or sub-subtypes among the 5 subtypes for dopamine, 4 subtypes for histamine, 14 subtypes for serotonin, 5 subtypes for adrenergic and 16 subtypes for cholinergic.

26. The micro-array according to claim 23, wherein the micro-array includes capture probes for the detection of 1 subtype of octopamine and the 14 subtypes of trace amines.

27. The micro-array according to claim 23, wherein the capture probes are derived from the list given in table 1.

28. The micro-array according to claim 23, wherein the capture probes are derived from the sense or from the antisense strand of the gene encoding the receptor.

29. The micro-array according to claim 23, further comprising capture probes fixed onto 2 or more solid supports.

30. A diagnostic kit comprising a micro-array comprising capture probes derived from the 5 major subfamilies of amine neurotransmitter receptors.